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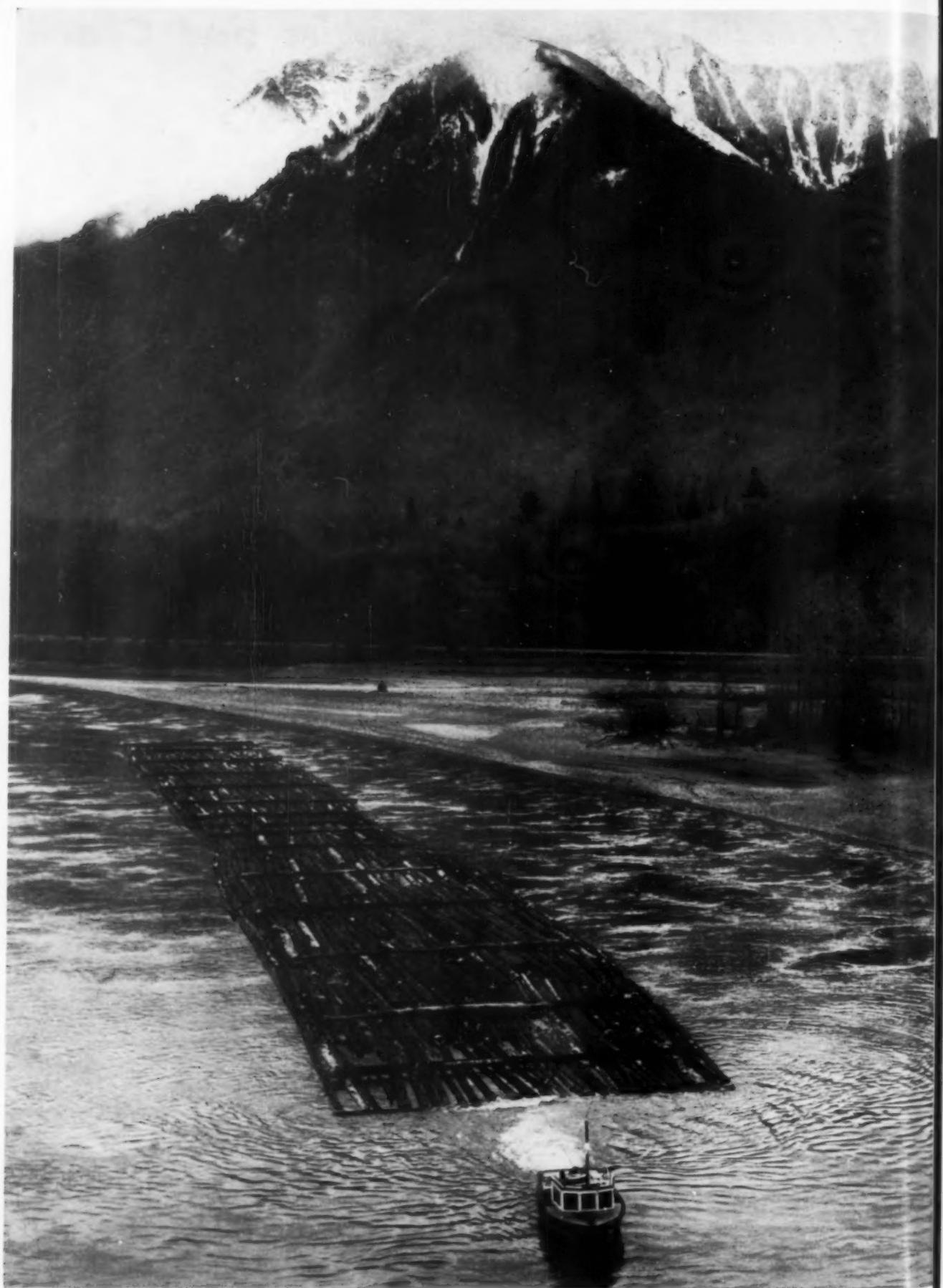
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Richard Harrington

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CONTENTS

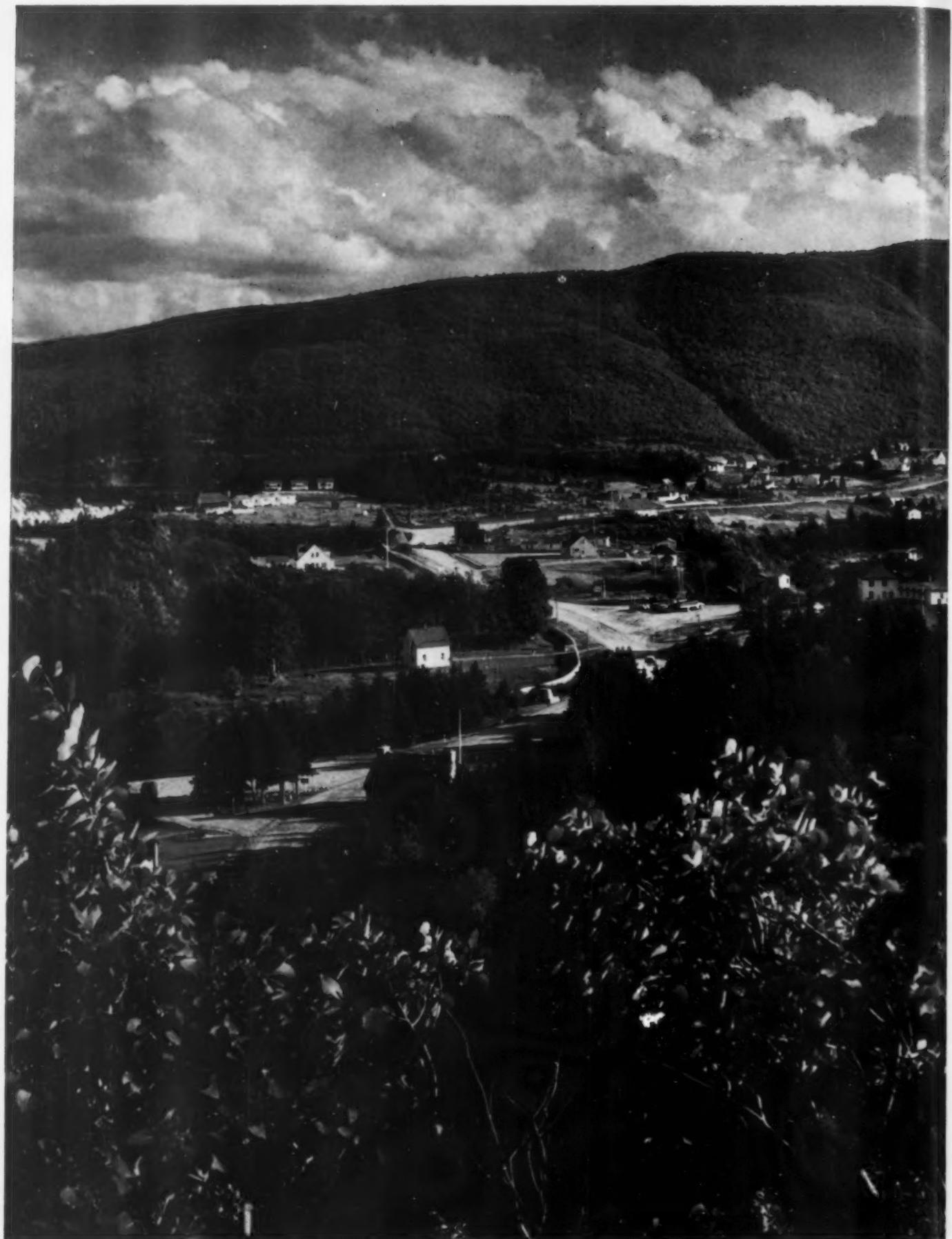
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COVER SUBJECT: *An attractive camp-site in an Ontario Provincial Park.*

Colour transparency courtesy
of the Ontario Department of
Lands and Forests

	Page
MINING IN NOVA SCOTIA	2
<i>by G. G. CAMPBELL</i>	
THE BRITISH ON SAN JUAN ISLAND	14
<i>by MABEL E. JORDON</i>	
PICTURES OF THE PROVINCES—XIX	20
INDUSTRY COMES BACK TO NEW BRUNSWICK	22
<i>by JOHN A. PATERSON</i>	
ENGLAND'S OLD TIMBERED BUILDINGS	32
<i>by W. H. OWENS</i>	
EDITOR'S NOTE-BOOK	V
AMONGST THE NEW BOOKS	V

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The flank of the great Northern Upland in Cape Breton viewed from skirting lowlands near Cheticamp.

Mining in Nova Scotia

by G. G. CAMPBELL

IN 1604, Champlain visited Cape d'Or, in what is now Cumberland County, attracted by Indian accounts of copper deposits. He found a cross, already crumbling to dust, to indicate that some unknown European had been there before him on the same errand. He also found flakes of native copper in veins and joints of outcropping volcanic rocks.

Champlain named the place Cape of Mines. The name migrated across the bay and was used during the Acadian period to designate the prosperous community that flourished around Grand Pré. Today, its spelling changed, it survives as Minas Basin and New Minas, a reminder that the European had no sooner set foot in the province than he began the search for minerals. That search has never ended.

Some Very Ancient History

Nova Scotia lies within the Appalachian region, a physiographic unit which extends from Newfoundland to the Gulf of Mexico. In ages very remote the area was occupied by the Appalachian Trough, a down-warping of the earth's crust into which the ocean intruded to form a shallow inland sea. Roughly parallel to the present shore-line, and separated from the main ocean by a large land mass now submerged in the Atlantic, this inland sea varied in size from age to age, sometimes stretching widely across the continent, sometimes shrinking to narrow basins. In its various transformations it existed for perhaps half a billion years.

On the bottom of this ancient sea, vast thicknesses of sediments accumulated and were slowly indurated, forming beds of conglomerate, sandstone, shale, limestone. There were changes in climate; times when hot and arid conditions dried up local basins, forming deposits of salt and gypsum; times when swamps and river-plains were choked with sub-tropical vegetation, the source of today's coal deposits. There were periods of local turbulence, when volcanoes spewed forth molten rock, or when the earth's crust yielded to inordinate pressure

by buckling and faulting. Finally, at the close of the Palaeozoic era, the whole area was uplifted, compressed and folded during what is known as the Appalachian Revolution. The sea was expelled, and sediments that had so long built up on the sea bottom were upthrust to form mountain ridges running north-eastward.

In Devonian times, long before this terminal upheaval, the Acadian region had experienced local unrest, when its rocky crust was folded and invaded by great masses of molten rock. Laid bare by erosion, these now form scattered granite areas in the upland regions of the province. The metalliferous mineral deposits are in the main traceable to these Devonian disturbances.

Immediately after the Appalachian Revolution the province stood above the sea. During Triassic times sediments accumulated in a long trough on land, as is shown by their deep red colour. This trough covered the areas now occupied by the Annapolis Valley and North Mountain, as well as lowland areas adjacent to Cobequid Bay. Late in the period, outpourings of fluid lava covered deeply much of the Triassic sediments. The black volcanic rock thus formed now stands as the ridge, 125 miles in length, known as North Mountain. The Annapolis Valley that lies behind and parallel to it has been carved from soft Triassic sediments unprotected by any volcanic covering. The Triassic period ended some 170 million years ago; when it ended, the rocky sub-structure of the province was everywhere in place. Since then the province has stood high and dry, wasted by irresistible erosive agencies.

The Present Face of the Land

Three-fifths of the province consists of areas underlain by crystalline rocks, igneous or metamorphic in origin. These areas, elongated and running north-eastward, have an average elevation some hundreds of feet higher than the lowlands that make up the rest of the province.



Lowland areas surrounding Minas Basin; North Mountain in the foreground.

Though the ascent from bordering lowland areas is always steep, and often precipitous, the upland surfaces are themselves remarkably uniform.

There are three upland areas in peninsular Nova Scotia. Reference has been made above to the singular volcanic ridge known as North Mountain. Averaging only a few miles in width it runs a straight course for 125 miles from Brier Island to Blomidon, where it curves fantastically into the Bay of Fundy, and there ends.

A line drawn from the head of St. Mary's Bay, along the South Mountain scarp to Wolfville, thence along the course of West River St. Mary's to Country Harbour and the head of Chedabucto Bay, delimits with some accuracy the Southern Upland. Lowland enclaves surround the town of Windsor, reach south to Grand Lake along the Shubenacadie and the Stewiacke, and form the valley of the Musquodoboit. These enclaves excepted, the southern part of the peninsula is underlain by slates and

quartzites of the Meguma Series, possibly Pre-cambrian in age, and by scattered granite masses intruded in Devonian times.

The Cobequids and the Pictou-Antigonish Highlands together form an upland belt, averaging ten miles in width, that crosses the province from Cape Chignecto to Cape George, a distance of over one hundred miles. This belt is not continuous, for at New Glasgow a lowland area some fifteen miles across separates the Cobequids from the Highlands.

In South Cape Breton, elongated and disjointed upland belts, all trending north-eastward, lie across the land like giant corrugations, separated from one another by lowland areas or by long arms of the Bras d'Or Lake system. The northern part of the island is a single plateau, sixty miles in length by thirty in width, having an average elevation of more than 1,200 feet.

The lowland areas of the province are underlain by softer, sedimentary rocks. The forces of



Aerial view of the gypsum workings near Windsor, Hants County.

erosion, through millenniums of time, have cut deeply into these softer areas, so deeply in places that a slight down-warping of the region brought the sea in-flooding to form the Gulf of St. Lawrence, the Bras d'Or Lakes, the Bay of Fundy, and the drowned valleys that lace the Atlantic shore-line. The lowlands are the farm-lands of the province. They separate and flank the uplands, penetrate deeply into them along valley bottoms, and are themselves far from featureless. In parts quite hilly, their identity as lowland areas can best be observed by contrasting them with neighbouring uplands. Save for two relatively small areas, they are underlain by rocks laid down in the Carboniferous period. Mention has been made of the Triassic sediments that floor the Annapolis Valley and border Cobequid Bay. In the Mira country of Cape Breton an elongated lowland area is underlain by Cambrian sediments. Elsewhere, the lowlands are Carboniferous in age.

Minerals that Occur in the Lowland Areas

The history of a given rock formation determines in large measure what minerals of economic interest it is likely to contain. It would be futile, for example, to look for coal or gypsum in the uplands. As it happens, it is the minerals found in the lowlands of the province, and for the most part minerals that could be found *only* there, that account for most of the province's present mining activity.

Anhydrite and Gypsum

Anhydrite is a mineral, white to bluish grey in colour, having the composition of calcium sulphate, CaSO_4 . Gypsum is hydrated calcium sulphate, having the formula $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. The two minerals resemble each other in appearance and usually occur together. In Nova Scotia deposits of gypsum are always underlain by anhydrite.

Calcium sulphate is one of the mineral salts



Gypsum workings near Milford, Hants County.

dissolved in sea-water. When eighty per cent of a given volume of sea-water is evaporated, the calcium sulphate begins to precipitate. The process can be observed today in certain semi-arid regions, where enclosed lagoons of sea-water are depleted by evaporation. For substantial deposits of the mineral to accumulate the lagoons must be refilled from time to time with sea-water, through tidal action or otherwise. In the Windsor epoch of the Lower Carboniferous, the necessary conditions prevailed in wide areas of the province, and resulted in the formation of anhydrite-gypsum deposits.

These deposits are very large, many square miles in area and reaching to hundreds of feet in depth. At present, apart from small amounts shipped abroad as fertilizer, no use is made locally of the anhydrite, although in Europe it is employed extensively in the manufacture of sulphuric acid, cement and anhydrite plasters. A cheap and efficient method of turning anhydrite into gypsum would make it usable. Or,

if a cheap process were devised to release the sulphate radical, the mineral could be used profitably to produce sulphur. As things now stand, the anhydrite deposits constitute a vast mineral storehouse that knowledge and improved techniques are certain some day to unlock.

Gypsum, on the other hand, has a wide variety of uses, especially in the building and construction trades. Finely ground, the mineral goes into the manufacture of wall board, sheathing, lath and insulating material. It is also a constituent of Portland cement and is used as a filler in cloth and paper. When the mineral has been heated to remove seventy-five per cent of its water of crystallization, it forms plaster of Paris, used in wall plaster and surgical plaster, in stucco, whitewash, and in the manufacture of an endless variety of casts and moulds.

It has been calculated that Nova Scotia contains 627 square miles of gypsiferous rock. At

Underground workings in the salt mine at Malagash, Cumberland County.

some time or other the mineral has been mined in ten of the eighteen counties. Since it is a bulky product best shipped by water, deposits near deep water have been most worked. At present about four million tons are mined annually, constituting ninety per cent of the Canadian output. Current production is from deposits at East Milford, Walton, in the Windsor area, at MacKay Settlement and at Little Narrows.

Salt (halite)

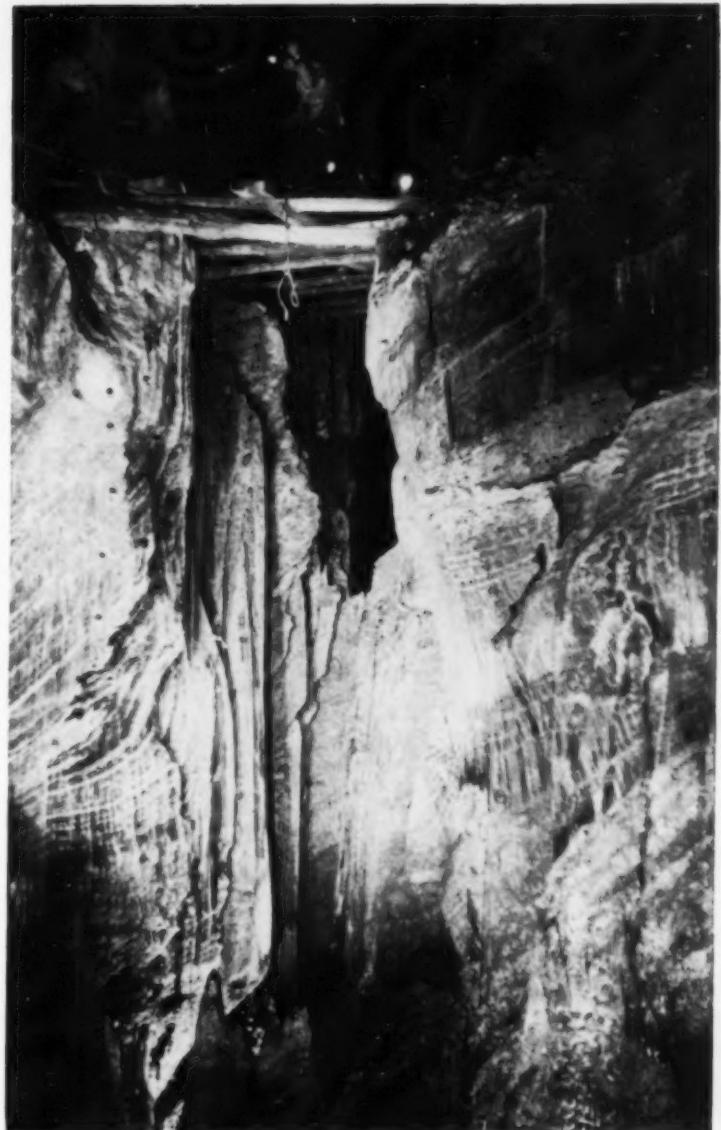
The chloride of sodium, NaCl, is a constituent of sea-water. Precipitated by evaporation of enclosed basins of sea-water, it forms deposits of rock salt, known also as halite.

In Nova Scotia, great thicknesses of the mineral occur in the Windsor formation of the Lower Carboniferous. A deposit at Mabou is known to have a vertical thickness of 4,000 feet, another at Nappan of nearly 5,000 feet. Other proven deposits are found at Malagash and at Pugwash. Salt springs in many other localities in the province may indicate the presence of other deposits, as yet unproven.

The Malagash deposit, lying close to the surface, was the first to be worked successfully. Mining began in 1919 and has continued ever since, although the deposit is now nearing depletion. In this operation, the rock salt is mined and brought to the surface by conventional methods where it is screened and crushed.

The Nappan deposit has been worked since 1947. Here the deep-lying rock salt is dissolved in water pumped from above into the salt beds. The resulting brine is then pumped to the surface and evaporated to dryness in a vacuum process.

Since 1956, work has gone on at Pugwash,



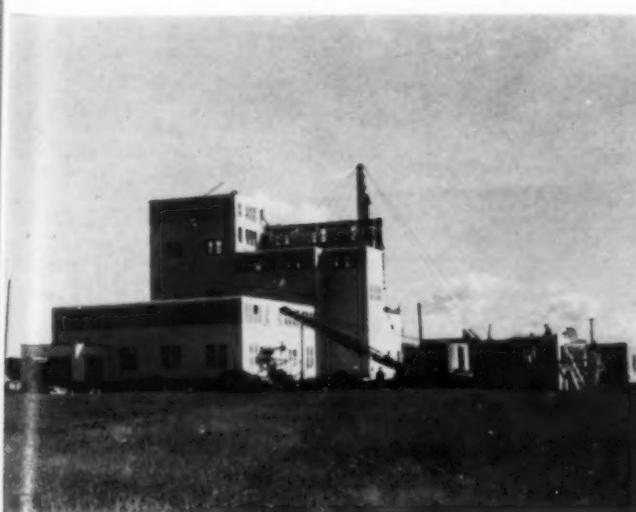
where a shaft is being sunk into a large deposit of rock salt. The overburden is badly fractured, and water conditions have presented a formidable engineering problem. Production is expected to start in the current year.

In 1957, the province's total production of the mineral was close to 125,000 tons.

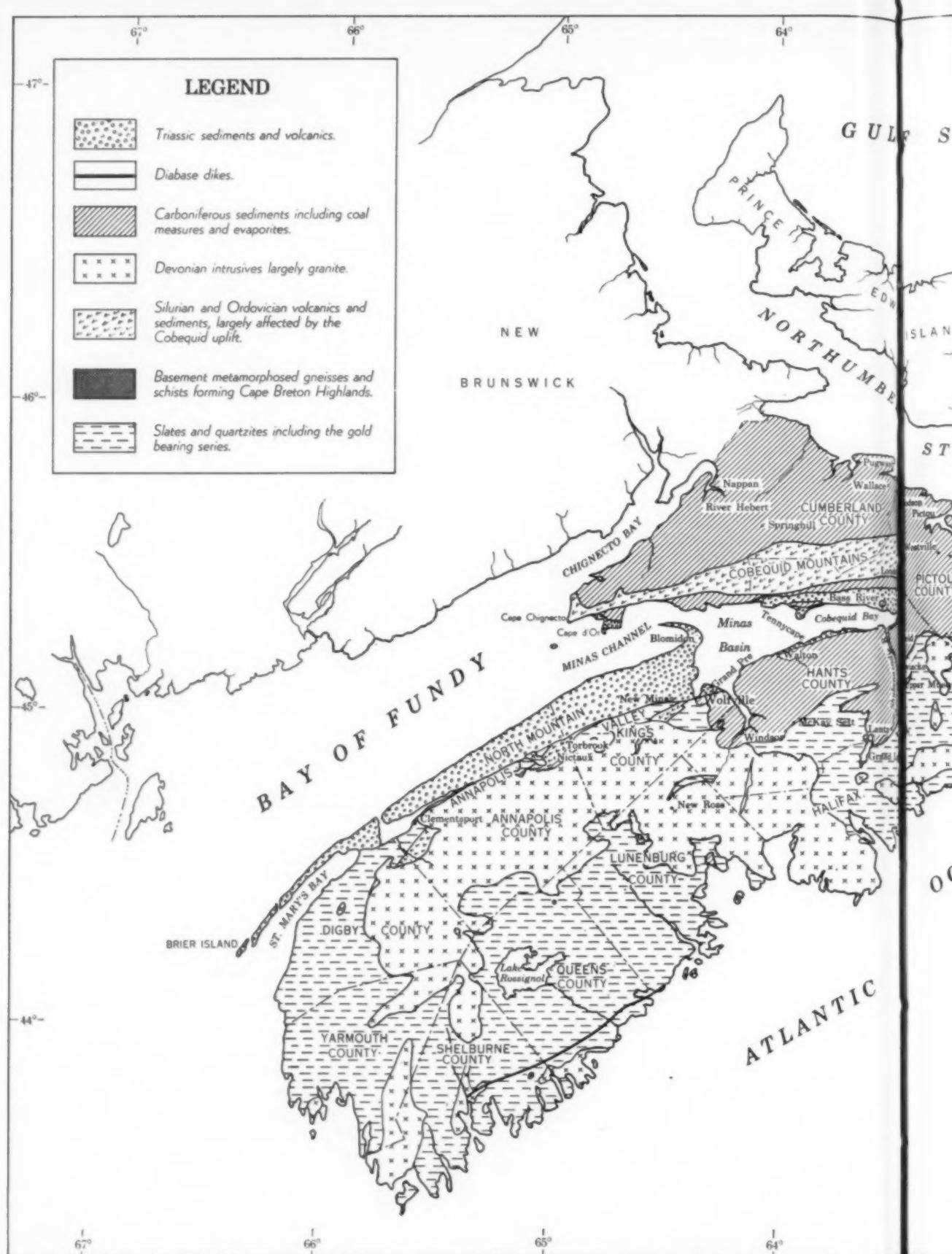
Coal

Coal is mined in four counties of the province: Cape Breton, Inverness, Pictou and Cumberland. Deposits in Colchester and Richmond are of slight importance, and have been mined only sporadically and on a small scale.

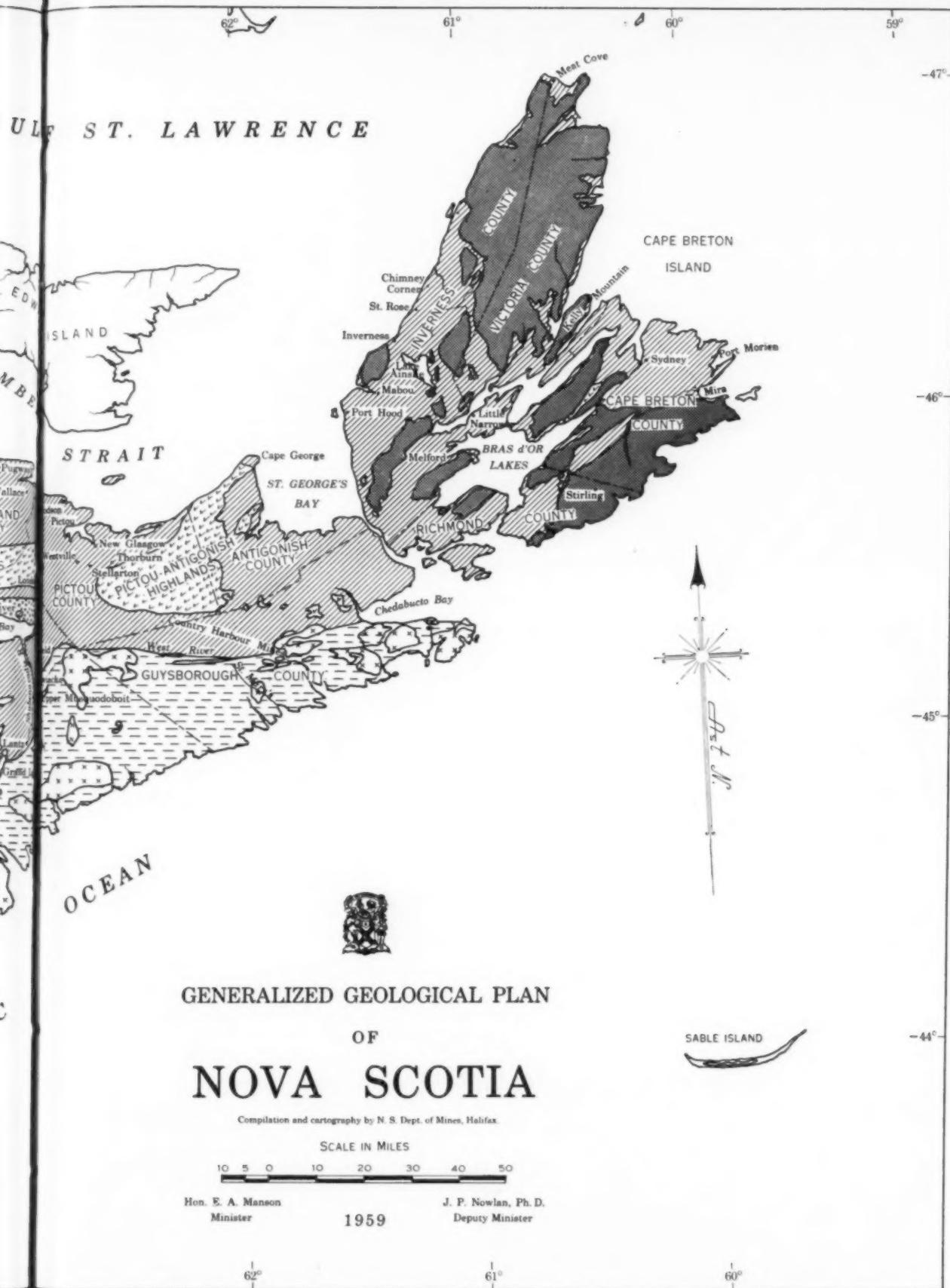
The Cape Breton field now produces eighty-five per cent of the coal mined in the province. The coal-measures, Upper Carboniferous in age, contain more than forty seams that dip seaward in low angles, ranging from four de-



Salt mine at Nappan, Cumberland County.



U L F S T . L A W R E N C E





The main haulage shaft of a coal mine.

grees to fifteen degrees. They occupy a narrow coastal fringe extending from Kelly Mountain to Port Morien, a distance of thirty-five miles, and extend an unknown distance under the Atlantic.

In Inverness County, coal occurs in detached basins at Port Hood, Mabou, Inverness, St. Rose and Chimney Corner. The coal-seams here dip steeply under the Gulf of St. Lawrence, making extended operations difficult and costly. The Inverness coal has a higher ash content than that of the Sydney area, is non-coking, and has a tendency to spontaneous combustion when banked.

The Pictou field covers an area roughly ten miles by three miles near the town of New Glasgow. Coal has been mined in the area for a

century and a half, mainly in the towns of Westville, Stellarton and Thorburn. The world-wide decline in the demand for coal has caused a marked slump in production in the Pictou field. The area now produces less than half the tonnage of twenty years ago and several collieries have ceased to operate.

There are two coal-fields in Cumberland County, the Springhill and the River Hébert. The Springhill collieries, deepest in North America, are no longer producing, but unmined reserves remain for future use.

Barite (barytes)

Barite is a ubiquitous mineral, found in rock formations of every age in the uplands as well as in the lowland areas. None the less, although

Pit-head buildings of a colliery in the Sydney coal-field.





Mill and shipping piers of the barite mine near Walton, Hants County.

it is known to occur in forty localities in the province, it has been mined only from deposits that occur in the lowlands, along the contact between the Windsor and Horton series of the Lower Carboniferous. It was mined in the past at Bass River, Upper Brookfield in Colchester County, near Hodson in Pictou County, at Middle Stewiacke and in the Lake Ainslie area. Current production comes entirely from a deposit near Walton, in Hants County, discovered in 1940, and known now to be one of the largest deposits of the mineral in the world. Annual production exceeds 200,000 tons.

In its pure form, barite is a white or near-white mineral having the composition of barium sulphate, BaSO_4 . The name, derived from the Greek for 'heavy', fits the mineral well, since its most striking physical characteristic is its heaviness; it has a specific gravity of 4.5. The spelling *barytes* is closer to the Greek original and is preferred by some writers.

The mineral is used extensively in drilling for oil. Finely ground and mixed with water, it circulates in the drill-hole, walling it with a dense coating that seals off escaping gas. Oddly enough, prepared in pure form as a precipitate, barium sulphate is also used to coat the inside of man's intestinal tract when X-ray examina-

tion is necessary. These instances exemplify the diversity of uses that have been found for barite and its derivatives.

Lithopone is one of these derivatives. Under many trade names it has revolutionized the manufacture and use of paints in the past quarter-century. It is employed in the manufacture of linoleum, oil-cloth, gaskets, rubber-coated fabrics and a variety of high-grade rubber products. It is a constituent of plastic wood and wood fillers, and is used as a filler in waterproofing canvas for tents and window awnings. Its uses are legion.

Other barium compounds derived from barite have uses too varied and numerous to allow listing here.

Limestone, Building Stone, Clay

Limestone deposits are exceedingly common, especially in the Lower Carboniferous rocks. The mineral is mined in a few localities, notably at Upper Musquodoboit, and ground for agricultural use. Sandstone is quarried at Wallace, Cumberland County.

A clay deposit at Lantz, Hants County, has been worked for many years. The clay is used in the manufacture of common brick, drainage tile and building tile.



Anticlinal structure in rocks of the Meguma Series. Quartz veins containing gold occur in such structures.

Other Mineral Occurrences

The Sulphide Minerals

Some metals commonly occur combined with sulphur, forming the sulphide family of minerals. The following are the more important members of the family:

- galena (PbS): the most important ore of lead
- sphalerite (ZnS): the most important ore of zinc
- chalcopyrite ($CuFeS_2$) { ores of copper
- chalocite (Cu_2S) {
- molybdenite (MoS_2): the only important ore of molybdenum
- pyrite (FeS_2): known as fool's gold
- pyrrhotite (FeS)

The last two listed are valueless as ores; they are of interest solely because of minerals commonly associated with them. Sulphide minerals have a tendency to occur together, and sometimes with gold or silver. Pyrite, of no value in itself, may indicate the presence of minerals that are of economic importance. Pyrrhotite sometimes contains nickel as a constituent, and is of interest for this reason. In the Sudbury deposits, nickel occurs in pentlandite ($Fe,Ni)_S$ associated with chalcopyrite and pyrrhotite.

Deposits of sulphide minerals, occurring either singly or in association, have been investigated in many parts of the province. In the 1930s, and again in the early 1950s, a complex ore was worked profitably at Stirling,

Richmond County, producing lead, zinc, copper, and minor values in gold and silver. Operations were suspended in 1956, when the ore body appeared to be exhausted. Unlike other known sulphide deposits, the Stirling ore is found in Cambrian sediments.

A large deposit of low-grade zinc ore has been outlined near Meat Cove, at the northern tip of Cape Breton Island. The ore is sphalerite, occurring as a replacement in crystalline limestone, near the contact of the Carboniferous and basement rocks. The Carboniferous limestones generally have been receptive to sulphide mineralization; many minor deposits are known in veins and fissures in the limestone, or disseminated in the rock itself. Recent investigations suggest that the Horton-Windsor contact zone, of Lower Carboniferous age, may be worth investigating for sulphides.

Molybdenite differs from other members of the sulphide group in its mode of occurrence. It is usually found associated with granite, either as flakes in the granite itself, or in veins or pegmatites in or near granite bodies. It occurs at New Ross, Lunenburg County, and in several localities in Cape Breton County.

Iron

There are known deposits of iron ore in Nova Scotia, but none has been successfully mined since early in this century.

The Londonderry field, on the south slope of the Cobequids, contains large deposits of

ankerite, a carbonate of iron, in itself valueless as ore. In places where the ankerite has been accessible to surface waters it has been altered to limonite, usable as ore. Pockets of limonite were mined from 1849 to 1908, and some two million tons were removed and smelted in the district. The operations here have a certain historical interest, for it was in the steel plant opened at Londonderry in 1870 that Sir Karl Wilhelm Siemens conducted his experiments with the regenerative gas furnace for smelting iron ore. Siemens' investigations marked an important step in the developing metallurgy of iron and steel.

The Nictaux-Torbrook deposits in Annapolis County were worked sporadically from 1829 to 1916. The ore was processed in a smelter near Clementsport.

Gold

Gold has been mined in the province since 1862, at one time or another in more than forty localities. Most of the production has come from rocks of the Meguma Series that make up the Southern Upland. The gold occurs in quartz veins, usually free and visible, but sometimes in associated sulphides. Annual production varies greatly; in 1939 it exceeded one million dollars in value, while in 1957 it did not reach \$50,000.

Manganese

Manganese minerals occur in many parts of the province. At New Ross, Lunenburg County, the ore bodies are found in fault zones cutting Devonian granite. Deposits here were mined sporadically from 1891 to 1921, and were opened briefly again in 1942. Underground development is again proceeding (1959). At Tennycape, Hants County, the mineral occurs in shattered Carboniferous limestone. Several deposits in the Tennycape area were worked intermittently between 1880 and 1900.

The Future

Much of the province has yet to be adequately explored for mineral deposits of economic worth. The upland regions in particular await detailed investigation. The geology of these regions is imperfectly known; the relative ages of the rock formations composing them have in many cases yet to be determined. Moreover, the upland surfaces carry a heavy overburden, often of sodden muskeg or peat bog, making difficult close investigation of underlying rock structure. Traditional prospecting methods are of little avail in such country unless they are amplified and reinforced by the devices and procedures used in geophysics and geochemistry. It will be the work of the scientist and the engineer to find the minerals that lie hidden in the hills.

Gold-bearing quartz veins in rocks of the Meguma Series.





This map indicating the San Juan Island boundary dispute clearly shows three separate channels. Captain George Vancouver travelled Rosario Strait (claimed by the British as the boundary), and it was marked on his map.

The British On San Juan Island

by MABEL E. JORDON

Photographs from B.C. Archives except where credited.

THROUGHOUT British Columbia's colonial days and for a year after entering Confederation, part of her boundary was still undefined. On San Juan Island, now included in the State of Washington, the Union Jack floated along with the Stars and Stripes until 1872. And it was through no fault of the colony's Governor, Sir James Douglas, that British sovereignty was not permanently established there.

The San Juan boundary affair was Britain's last stand in the United States. Plenty of evidence remains to indicate that a British military force was once well entrenched. A study of the subject reveals that under the provocation then existing, their superior military strength could have enabled them to take the island with very little, if any, force of arms. Yet with greater forbearance than has sometimes been credited to the British, particularly in colonial matters, they refrained.

When the Oregon Treaty of 1846 failed to define the water boundary line separating Vancouver Island from the continent, complications were inevitable. The forty-ninth parallel of north latitude, being the International Boundary line on the mainland, presented no problem, at least not until it intersected the coast. From there it was to go southerly through the middle of the channel between Vancouver Island and the continent, but the treaty made no mention of the group of islands in the channel, nor did it indicate which strait through the isles was intended.

At stake in the argument which followed was the sovereignty of the Haro Archipelago, now called the San Juan Islands, a group lying in the channel between the Gulf of Georgia and the Strait of Juan de Fuca. The British claimed that Rosario Strait was intended as the boundary channel, while the Americans insisted that it should be Haro Strait. The whole matter of settlement revolved on the interpretation of the treaty. Twenty-six years were to elapse before the final decision was made, during which

an interesting part of British Columbia history was made.

No major difficulty became apparent until the Hudson's Bay Company ship *SS Beaver* landed a flock of sheep on San Juan Island to establish a farm, in charge of Charles Griffin. San Juan is the largest of the group and the nearest to Vancouver Island. A United States Customs Collector, Mr. J. M. Ebey, made a point of warning Governor Douglas of Victoria that the animals might be liable to seizure for non-payment of taxes. Douglas replied that San Juan was British soil and to back up his statement he appointed Griffin as Stipendiary Magistrate. Intervention by the American Secretary of State brought about a proposal for peaceful co-existence, without attributing any priority to either nation, until territorial nationality should be decided. Both agreed, but not before Douglas had pressed a strong claim to have the original status restored.

For several years apathy surrounded the negotiations to settle the controversy. At one stage the British offered a compromise to accept a middle channel, which would have given to each nation a free road to its own territory, but it was refused and the stalemate persisted.

With the gold rush to the Fraser River of British Columbia in 1858, more settlers stopped on San Juan. One man in particular, an American named Cutler, was openly resentful of the Hudson's Bay Company and its large holdings on the island, and when a breeding boar belonging to the company strayed on to his land, he shot it. Not satisfied with that, he persuaded others to petition the United States military department of Oregon to occupy the island.

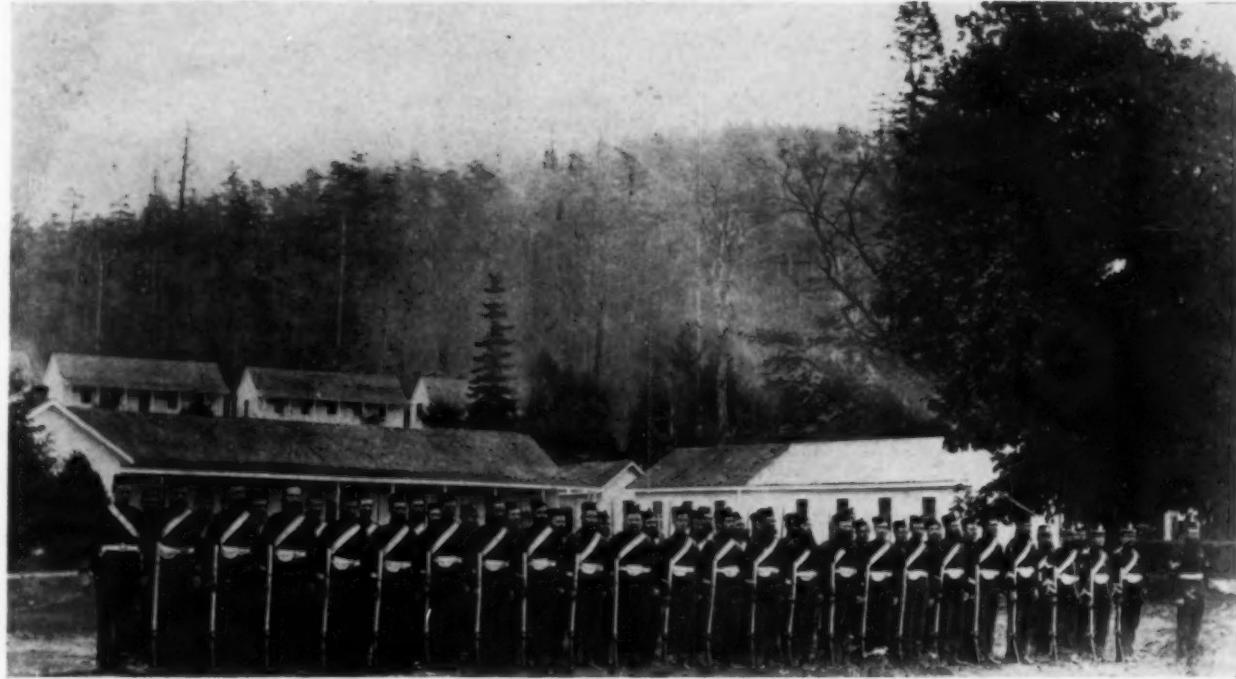
General W. S. Harney, in command at the time, sent Captain George Pickett with sixty men to set up a military post on San Juan in July of 1859. This coup was accomplished without any authority from Harney's superiors, nor did he communicate his plan to the British. This action by the two southern gentlemen violated the earlier agreement of mutual respect,



British Camp prior to construction. The fence indicates that a garden was being planned. The force landed in March, which gave ample time for any planting to mature.

The American Artillery Camp shortly after Captain George Pickett's troops landed in July 1859. Pickett was sent to occupy the island by General W. S. Harney, but without any authority from Harney's superiors.





*British Garrison, Royal Marine Light Infantry, on San Juan Island, after the construction of the camp.
One of the buildings is still intact.*

and Governor Douglas lost no time in sending *H.M.S. Tribune*, commanded by Captain Hornby, to the scene to protect British subjects. Hornby landed no troops but offered Pickett a plan of joint military occupation for the island which was refused.

A formidable array of armed British ships carrying a detachment of Royal Engineers and Royal Marines soon hovered just offshore, while the American Ninth Infantry was busy constructing a camp and a system of earthworks. When word of Harney's action reached the Capitol at Washington, both he and Pickett were quickly removed from the island and a plan of joint military occupation for the duration of the boundary dispute was agreed to. On 20th March 1860, about eighty men of the Royal Marine Light Infantry, under command of Captain George Bazalgette, landed on the northern part of the island. There a permanent camp was erected and occupied for the next twelve and a half years. This picturesque place is now known as English Camp.

One more incident marred the otherwise harmonious occupation. General Harney, angered at the treatment he had received, made another attempt to control the situation by restoring Pickett to the command of American Camp. Harney and Pickett were soon deposed and reprimanded. Harney was returned to his native south and Pickett ordered to serve in the

Civil War, but the latter resigned his commission and escaped to Virginia by way of Canada, joined the Confederate Army and became famous as the General Pickett who led the suicidal attack at Gettysburg. Thereafter, during the rest of their stay on the island, the forces of both nations fraternized freely, many being on terms of personal friendship.

The boundary issue became shelved again, primarily because the Civil War was raging, but it erupted sharply when a Joint High Commission finally took the matter in hand in 1871. One of the five British members was Sir John A. Macdonald, then first Prime Minister of Canada. Each side was adamant on its own interpretation of the treaty. To end the serious deadlock, the British made the first move by proposing that the question be referred to arbitration. The United States would only agree providing the arbitration be limited to the Haro and Rosario channels, and that the decision be binding. To this the British conceded, perhaps unfortunately, as the middle channel was thus ruled out entirely and this precluded the possibility that the arbitrator might consider it.

William I, Emperor of Germany, accepted the office of arbitrator and made his award on 12th October 1872 in favour of Haro Strait as being most in accordance with the true interpretation of the Oregon Treaty. Thus the San



Above.—A recent photograph of the bastion at English Camp, built almost 100 years ago. The site is privately owned, but visitors are allowed in under supervision.



The remains of the original outdoor forge used by the Royal Marine Light Infantry during the joint occupation.

Photographs on these pages by the author.



In this cemetery are buried the British soldiers who died while stationed on the island. Mr. James Crook, shown here, owns the cemetery site and maintains the fence and graves. He has lived at English Camp for eighty years.

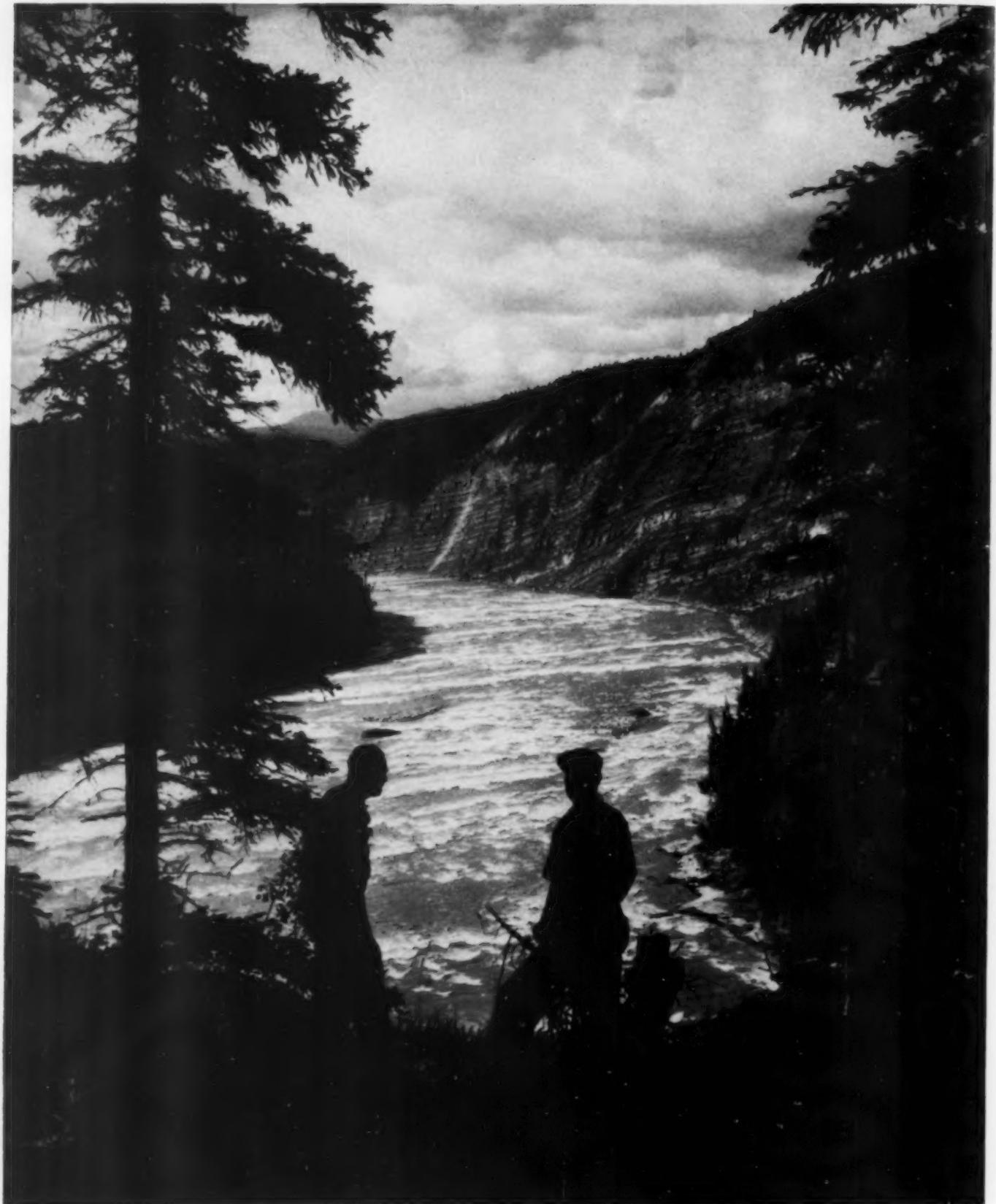
Juan Islands, which would otherwise have been part of British Columbia, became United States territory. After waving for twelve years over the island, the Union Jack was lowered and Her Majesty's forces were withdrawn.

At English Camp the sturdy old blockhouse is still intact, overlooking Garrison Bay as though yet resolutely on guard. It is well cared for by Mrs. Mary Davis and her brother, whose parents homesteaded the site soon after the forces left. In their home are several relics of those historic days. One is a painting of the camp done by one of the soldiers, which was left behind. Crossed above it are two tiny

silk flags, the Stars and Stripes and the Union Jack.

Nearby, almost at the summit of Mount Young, is a little cemetery where nine of the Royal Marines who died during their sojourn on the island were buried. It is also well cared for by the same couple, who receive a small sum annually from H.M.C. Dockyard at Esquimalt, British Columbia, towards its maintenance.

At American Camp only the humps of the old earthworks are left. Identical monuments were unveiled at both camps in 1904 on the thirty-second anniversary of the arbitration award.



Pictures of the Provinces—XIX

In the last few years the Peace River district has been the scene of extensive drilling for natural gas and oil. About fifty miles north of Fort St. John, British Columbia, where much of the exploratory work is in progress, the waters of the Peace have cut a deep canyon through the Rocky Mountains; the Peace River Canyon is of interest chiefly because it is in this general area that the Swedish industrialist Axel Wenner-Gren proposes to construct a large power dam for which surveys are now being conducted.

British Columbia Government



Peggy's Cove in Halifax County, Nova Scotia, has become increasingly popular with tourists and artists who visit this secluded south shore fishing community to photograph or paint, or simply to view, the tiny inlets with their fishing boats and nets, the neat homes with their flower gardens, the lighthouse and the sea.

Nova Scotia Film Bureau



Aerial view of the port city of Saint John, showing the city's well equipped harbor in the Atlantic region the port is open throughout the year.



Industry Comes Back To New Brunswick

by JOHN A. PATERSON

WHEN TODAY'S New Brunswicker looks at the industrial growth taking place in his province there can be little wonder if he sometimes pauses in his new enthusiasm for development to review a past that was not always one of progress.

Perhaps no part of Canada has had a longer and more varied industrial history than the Maritime Provinces, particularly New Brunswick. When Ontario and Quebec, today's industrial giants, were mere "outposts of Empire", sparsely populated as Upper and Lower Canada, New Brunswick was already widely industrialized and Saint John had become Canada's leading manufacturing city.

Unfortunately this was not to last. About the mid-point of the past century a combination of factors developed which for some time seemed destined to destroy all that had been accomplished. Not until between the two world wars was the province again to see an upturn in its economy that would offset the effects of the change from sail to steam and the loss of markets brought about by the end of reciprocal trading agreements with the United States. These resulted in a perhaps unnatural trading pattern of east and west with the rest of Canada which was further emphasized by Confederation in 1867.

Shortly after 1920, new techniques and a great demand for pulp and paper created a new opportunity for a province that was more than eighty per cent covered with accessible forests located at or near seaboard. By the start of the Second World War 42.2 per cent of the province's industrial investment was in this industry.

At that time the value of manufactured production was \$66,000,000 annually, hardly any greater than it had been more than twenty

years earlier. However, by the end of the Second World War the total had more than doubled to \$156,000,000, although the province had not shared to any great extent in Canada's development of wartime production.

Our New Brunswicker at this point found however that over the years he had accumulated certain industrial assets which were to form the nucleus upon which future growth was to develop. Still foremost as a natural resource was the forest, which accounted for fully one-half of the provincial economy and of this half, two-thirds now came from the pulp and paper industry. In other fields of manufacturing as well, a number of long established and highly regarded industries had weathered all the storms and were perhaps in a more solid position than ever.

One-quarter to one-third of all the stoves manufactured in Canada, together with heating equipment, were made in the Sackville-Moncton area. The largest brush producer in the Commonwealth was located in Saint John, where also were produced valves and specialized pipe fittings which were sold across Canada. New Brunswick candies and confectionery

were cherished from coast to coast. Fredericton's top quality dress and outdoor shoes for men were known by Canadians everywhere, and from the same city came many of the canoes in use in Canada.

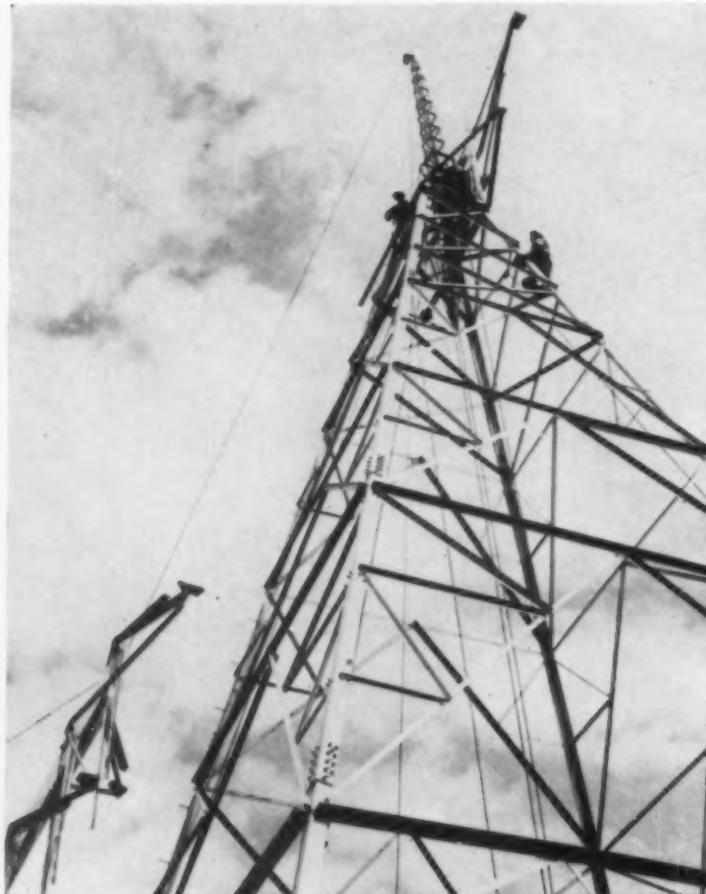
Anyone who has studied the most elementary Canadian geography knows of Saint John's great dry-dock and shipbuilding industry. Nearby is one of Canada's largest sugar refineries. Cotton textiles were manufactured in several locations, although later to be victims of world distress in this industry and then, in part at least, to recover.

The province, by virtue of its location, had traditionally been a fishing area. Unfortunately tradition still played a large part, and much in the way of fishing practice showed little change from a century ago. Noteworthy exceptions were the world's largest sardine producer on the Fundy coast and the modern production of lobsters for the growing American market.

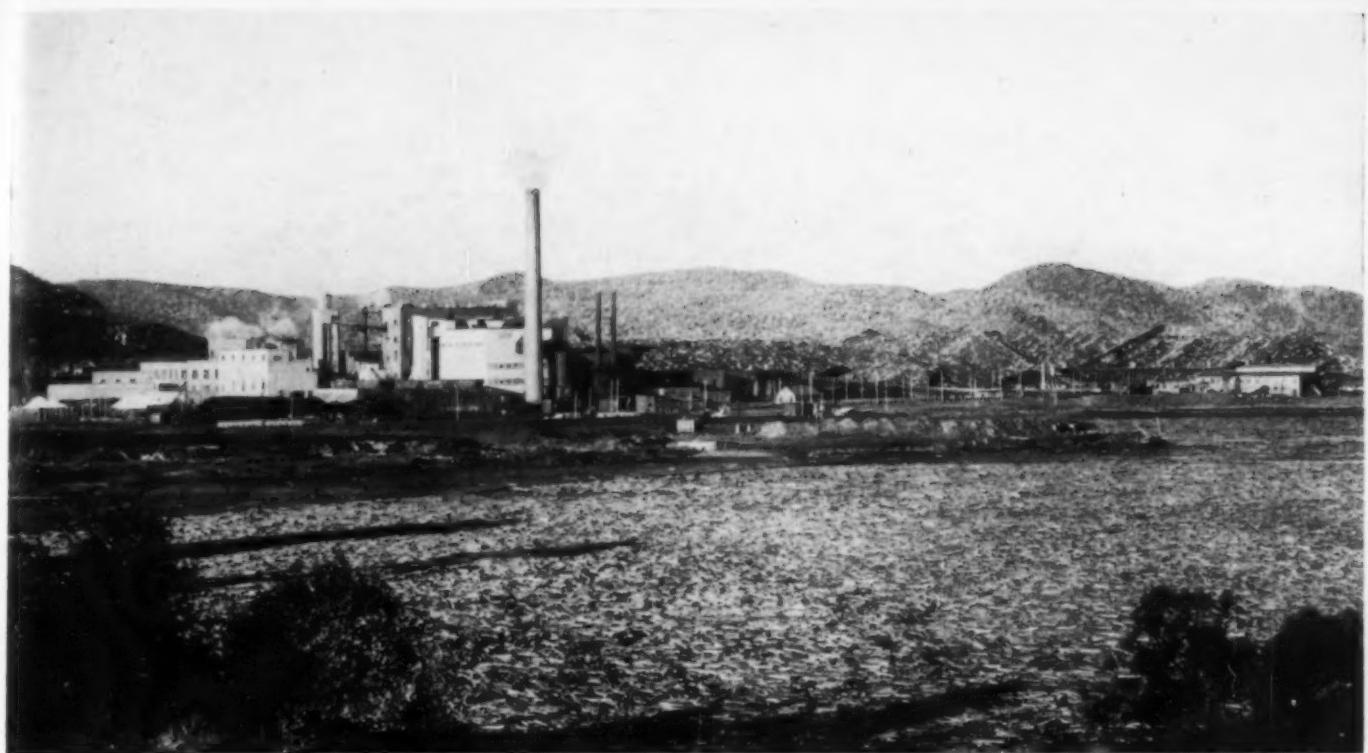
In the five years following the war instead of industrial production declining, as had been feared, it almost doubled again. A review of this period shows that very little, if any, new industry came into being and that the expanded production — apart from some dollar value fluctuation — was almost entirely due to increased production from existing industry. This was a most significant fact: it expressed the first optimism on the part of New Brunswick investors in their own province in almost one hundred years. While 1950 did not necessarily mark the end of this new phase in New Brunswick industry it did mark the beginning of a new era, that of new industrial development.

Once again, as had happened so long ago, an entirely new set of values and factors had come into play. This time however they were to become the basis for new growth, rather than a period of recession.

The inclusion of Newfoundland as a Canadian Province and the rapid growth of the original Maritime Provinces offered a regional population of nearly 2,000,000 people — for the first time an attractive market for industry to enter. Increased shipping charges in the post-war years, while adversely affecting bulk shipments out of the area, began to have the effect



New sources of electric power are being developed to meet an increasing demand from industry.



One of the seven producers in the province of pulp and paper, New Brunswick's major manufacturing industry.

of a tariff. This led to the establishing in New Brunswick, often in Moncton, of distribution facilities to serve the Atlantic region, and this was followed by the branch plant or local industry, which if efficiently operated can compete with the mass-produced article from elsewhere.

Greater industrial demands for power have made possible the establishing of larger and more efficient electrical generating units, thus enabling lower costs to be offered to the manufacturer. The Beechwood installation on the St. John River is typical of this trend as are the large thermal plants planned for early construction. No longer is the province a "power-poor" area.

Perhaps one of the greatest sparks to development impetus came from a source that even two or three years earlier would have been least expected. From the earliest days it had been known that a variety of minerals existed in the province. Some of them had been the basis for highly successful promotional ventures, but their development had advanced little further. The deposits were considered to be rich, but uneconomic in extent.

This view, however, did not satisfy prospector Paddy Meaghan of Bathurst, who about 1950 convinced a group willing to back him, and

the result was the great base metal finds — lead, zinc and copper — that were to focus the attention of the mining world on New Brunswick and start one of the greatest staking rushes that Canada had known.

While a subsequent collapse in world prices for base metals has slowed activity in the mining areas, many millions had been spent in their development and production had actually commenced. Much of the preliminary work has now been done and with the restoration of the market picture, New Brunswick should have a substantial mining industry.

Perhaps even more important was the impact that the mining potential had on two different groups of Canadians. It focused attention on New Brunswick and investors elsewhere in Canada liked what they saw. As a sequel New Brunswick people themselves, seeing the interest which others were taking in their province, began to throw off generations of apathy and to discover that opportunity was right on their doorstep. Thus began a period of industrial growth that will certainly change the teaching of New Brunswick's economic geography in Canadian schools. No longer was this to be an area of low industrial activity.

The course of this new manufacturing fell into two classes. Perhaps that with the greater

scope was manufacturing to cater to the Atlantic regional market, supplying products which had previously been brought in from elsewhere. It was found, for example, that a high percentage of food-stuffs, clothing and other articles, which were in almost daily demand, were coming from elsewhere and could be produced locally in many cases, if the initiative to do so existed.

The second class was the high value, low volume type of product, which could stand a reasonably stiff shipping cost, and be sold competitively in broader markets by taking advantage of local factors which the province had to offer.

One of the first of the new industries was the making of Portland cement at Havelock, based upon the limestone and gypsum which occur in the immediate vicinity. This product was soon to be sold throughout the Maritime area, and the plant has operated at capacity ever since.

Almost at the same time came a plant to manufacture ladies hosiery in Sussex. These were to be sent throughout Canada and could be shipped at a relatively small charge as a ratio to their total value and maintain a competitive position.

These plants were typical of the development which was to follow. Soon men's clothing and women's and children's shoes were being produced in Edmundston. These were a wel-

come industrial diversification in a city which was almost wholly dependent upon the pulp and paper industry with little demand for other than male workers.

New Brunswick had become world famous for the quality of its potatoes, both for table and seed use — and justly so. Starch had been extracted from the familiar tuber for many years. Three plants came into operation to produce potato chips. But this was not all. Becoming aware of the large Canadian imports of frozen French fried potatoes from the United States, the four McCain brothers, the youngest generation of a family long associated with potato growing, decided that these should be produced in New Brunswick. A modern processing plant and freezing facilities were set up in the potato growing area and were soon in production. Next peas were added and of course the famous New Brunswick fiddlehead. The plant continues to expand and its products are sold from coast to coast. It has brought diversification and an assured market to the farmers of the area.

Following the Second World War provincial government attention was turned to modernizing the fishing fleets. This was most successful along the Gulf of St. Lawrence coast where a large fleet of modern driggers came into operation. The fish processing industry met the challenge of increased catches, particularly of cod,

This mill, in the Newcastle area, produces zinc, lead, and copper concentrates.





Valves and specialized fittings known throughout Canada are made in the Saint John area.

haddock and flounder, and improved their plants to meet the growing demand in the United States and Canada for fresh and frozen fish fillets. The result has been an increase in annual production of fish from a pre-war value of \$4,000,000 to today's \$25,000,000.

More recently the programme has been extended to the Bay of Fundy coast, and what is perhaps Canada's most modern fish processing plant was constructed at Beaver Harbour by Connors Brothers who had long been successfully engaged in the sardine canning business.

Moncton's growth in the post-war years, which has seen its population at least double, has been largely due to that city's becoming the distribution centre for the Atlantic region. Many national companies have established

large warehousing facilities to which they ship in bulk for local distribution. Following the trend usually associated with this type of development, some of these operations have already advanced to manufacturing or processing. It is inevitable that more of this will come about.

Significant changes have taken place in the lumber-and-wood-using industries resulting in a higher degree of New Brunswick labour going into this largely exported commodity. Most lumber is now shipped dressed and cut to dimension. This has resulted in larger and more efficient fabricating units in a number of locations and some consolidation of the numerous small operations which are characteristic of this industry.



Paint brushes, household brushes, brooms and mops come from this Saint John plant.

More attention has been given to waste utilization and one plant is now making a building board while another turns out a fuel made from shavings and sawdust. More recently a number of sawmills have installed chipping equipment which converts their wood waste into a form which is very acceptable to the pulp and paper industry.

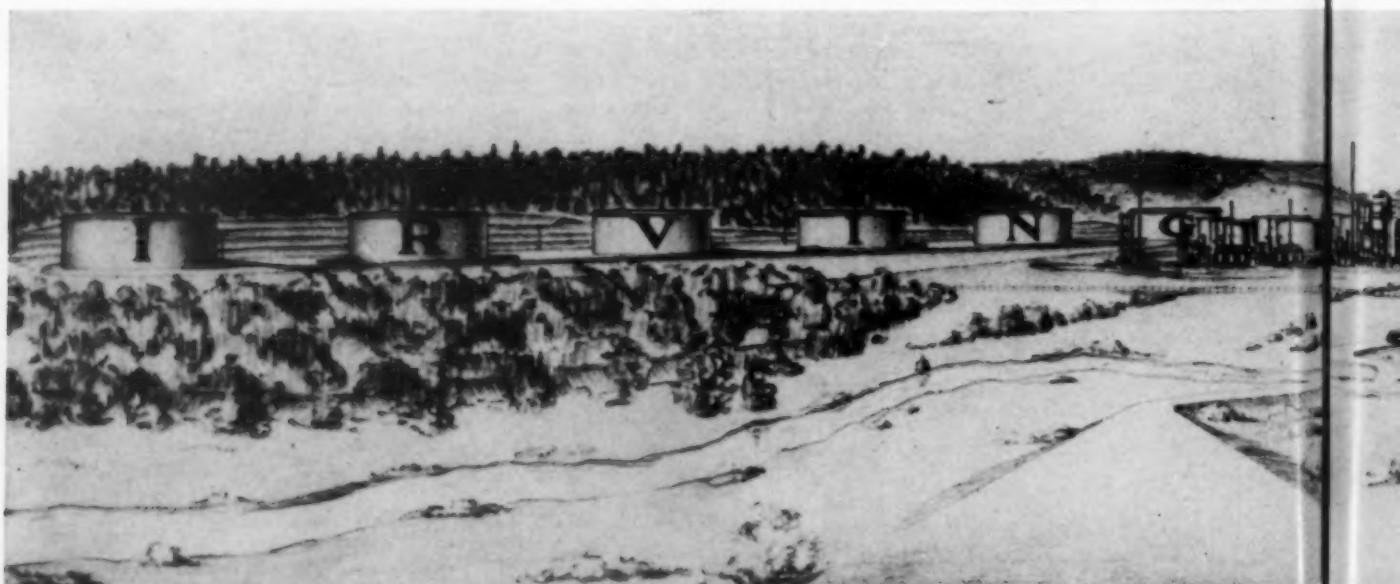
Strangely enough, Saint John, the largest city and concentration point of New Brunswick's manufacturing, was slow to react to new development. The many older firms in the city had expanded, in keeping with increased business, and of course much of the economy of the city and area revolved about the seasonal

operations of one of Canada's two chief Atlantic year round ports.

When expansion did come it came at a surprisingly rapid pace. Early in 1958 a new plant was opened to make transparent plastic containers for the retail trade; this was shortly to be followed by an entirely new venture for the Atlantic region when Western Wire and Cable Company Limited opened a completely modern factory to manufacture electrical conductors for the growing power development programme taking place in the area.

At the same time Joseph A. Likely and Company, who had long been manufacturing a variety of products chiefly for the construction

This major oil refinery is now in operation.



industry, opened an up-to-date plant to manufacture concrete and concrete products on the shores of Courtenay Bay. This was the forerunner of what seems destined to become once again one of the important heavy industrial areas of eastern Canada, started so long before by the dry-dock and shipbuilding installations.

However the greatest impact on Saint John's industrial growth was to come from the Irving interests. This huge industrial empire, headed by Kenneth C. Irving, a native of New Brunswick, now extends throughout the Atlantic Provinces to other parts of Canada and even into the United States. It embraces a wide diversity of fields of endeavour and includes lumber, pulp and paper, oil distribution, road and water transportation, hardware, and publishing, to mention only a few of its facets.

Early in 1958 Mr. Irving announced that, together with Kimberley-Clark Products Limited — a name well known in paper production — the plant of Irving Pulp and Paper Limited, which had recently been almost completely rebuilt, would be expanded to enter the field of kraft production and probably also the manufacture of newsprint. The whole expansion will involve the expenditure of many millions of dollars.

Shortly after this came news of the intention to start immediately upon the construction of one of the largest and most modern oil refineries in eastern Canada, to supply the ever growing chain of Irving oil and gasoline outlets that now covers the whole Atlantic region and extends almost to Montreal in the Province of



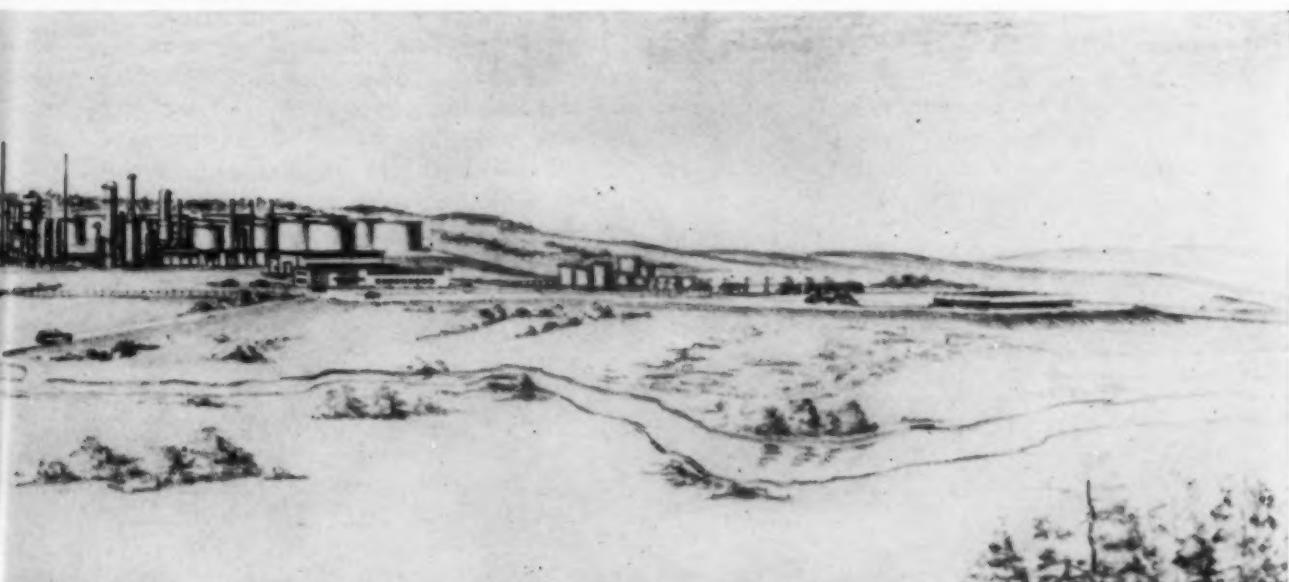
Modern machinery and improved methods accelerate production in this food plant.

Quebec. The \$50,000,000 to be expended on this project would give immediate employment to many during the construction period and continue to do so when it comes into operation in 1960 or 1961.

Almost at the same time another Irving project — Ocean Steel Products Limited — had begun to manufacture steel construction forms and other related items on a major scale in a new plant built on the Saint John harbour front. These major developments, along with others of a commercial and industrial nature, brought capital investment to about \$100,000,-000 in the Saint John area within a single year.

Any complete recital of new industrial enterprise in New Brunswick in recent years would have to include the revival of the cotton indus-

now under construction in the city of Saint John.





Modernization has extended to fishing fleets.

try in Marysville, the production of knitted wear in St. Stephen, the fabrication of metal drainage products in Sackville and a growing handicraft industry throughout the province. This would only be part of the picture; however, sufficient has been told to illustrate the growing industrial nature of New Brunswick's new economy.

Not only has the new industry added to the incomes of the people but it has also added diversification and, therefore, stability to an economy that had for so long been heavily dependent upon lumber, fish and potatoes. Perhaps equally important is that modern efficiency has been the key-note in setting up new industries and, further, for the most part they will operate year round — a great boon to a previously highly seasonal economy.

In these greatly changed elements of his world, what does our New Brunswicker see for

the future? Is this merely a boom that may have run its course? The evidence is strongly in favour of continued expansion of a substantial nature. Already announced are plans for a chemical industry that will produce chlorine and caustic soda chiefly for the pulp and paper industry, which now is made up of seven plants in the province. Plans are well advanced for an eighth producer in this field to manufacture newsprint.

Both of these new ventures would be in the Saint John area, as will be a new factory to manufacture building products and highway surfacing materials, for which tenders have now been called. The wood-using industry seems destined to enter a new phase with a greater degree of processing taking place in New Brunswick. Soon to come into operation is a box veneer plant and adjacent to it, and utilizing much of its waste as a raw material,

INDUSTRY COMES BACK TO NEW BRUNSWICK

will probably be a producer of high-grade charcoal for fuel and chemical purposes.

Integrated wood-using operations seem to be a desirable feature of future planning in this industry. Much interest now exists on the part of several substantial operators in the manufacture of particle board. This might well be tied in with a sawmill-planing mill project or a furniture manufacturing project — perhaps both. In this way the sharing of common facilities may be developed by separate operators to the benefit of each and with reduced overhead charges, thus improving the competitive position of each in its own market.

The manufacturing of women's wear and aluminum fabrication are soon to be undertaken in Moncton and a plant is already under construction to convert the waste from starch production to a usable commodity as a cattle feed.

A few years ago a large deposit of manganese ore was found in the Woodstock area and much research by Stratmat Limited has gone into a suitable method of extracting the metal. This now seems to be solved and the process which has been developed will give iron and steel as by-products. This may therefore, besides bringing about the production of ferro-manganese, lay the foundation for another entirely new industry. New interest is again becoming apparent in the base-metal mining operations with more development work to be undertaken this summer. There is every hope that mining will soon be renewed and perhaps advances made toward smelting operations.

The high sulphur content of these ores intrigues the imagination with possibilities for the formation of a substantial chemical industry. Upon the basis of sulphur one can picture the production of fertilizers and heavy chemicals for the Atlantic Provinces market and, because of the possible seaboard locations, even the entering of world export markets under unusually favourable circumstances.

With manufacturing production now substantially in excess of \$300,000,000 annually and after a review of what has been taking place during these past few years, there seems little doubt that industry *has* come back to

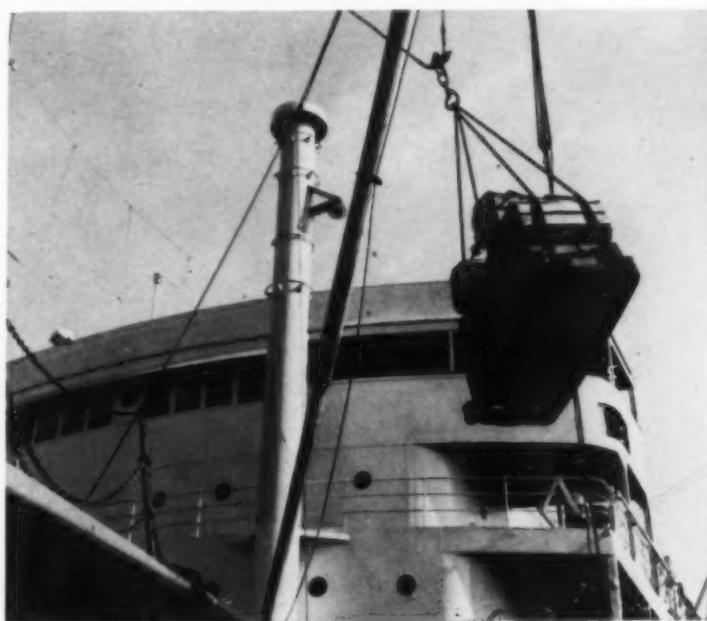
New Brunswick and in the long term has come to stay.

So many of the elements necessary have now come into being that further development seems inevitable. The long years of no expansion, or practically none, have left many gaps and recent experience has been that these can successfully be filled, once confidence has been established.

The province already has a nucleus of new industry, much of it directed by a generation of young and imaginative operators. They have tailored their approach to take advantage of the peculiar circumstances which exist and are ready to expand with each new opportunity. Heavy industry is coming into being to form a strong backbone to this changing economy.

It has been said that industry breeds further industry and New Brunswick should prove no exception. As populations in the accessible market increase, additional production and service requirements will come into play. With increased purchasing power the standard of living is rising, thus opening up new opportunities previously never considered. New Brunswick, centrally located in the Atlantic region and adjacent to the great markets of central Canada and the eastern United States, seems destined, on an appropriate scale, to become a new Canadian industrial frontier.

The shipping season sets the pulse of business activity in Saint John.





The Feathers Hotel at Ludlow, Shropshire, has an intricate "magpied" front.

England's Old Timbered Buildings

by W. H. OWENS

SOME OF THE MOST attractive old buildings of England are the timbered homes and halls which date chiefly from the sixteenth and seventeenth centuries. In a land which is famous for its heritage of beautiful domestic architecture, it is these which show off to greatest advantage the imaginative skill and ingenuity of old-time craftsmen.

Timbered buildings are a legacy from mediaeval times, when a great part of England was covered by forest. Except in the stone districts, such as Cornwall or the Cotswold Hills, the earliest village homes were built almost entirely of timber. When the great woodlands were thinned out by widespread fellings, largely for ship-building, timber was used more sparingly to provide only the framework of cottages and small manor houses.

This led to the half-timbered or black-and-white style of construction, which is characteristic of many districts of southern and central England. Such care has been taken to preserve these Tudor and Jacobean buildings

that splendid examples are to be seen today in more than twenty counties as far north as Yorkshire and Lancashire.

By far the greater number, however, belong to the West Midlands and the borderland district of England and Wales. In Cheshire, Shropshire, Herefordshire and one or two adjoining shires, this type predominates in town and country. South from the mouth of the River Dee to the Severn Estuary all the variety and charm of English timbering may be seen in buildings ranging from wayside cottages to the grand old Elizabethan mansions of Chester and Shrewsbury, and from farm dovecotes to stately guild-halls.

In its simplest form the black-and-white house had regular plasterwork panels between horizontal and upright timbers. During the late sixteenth century, however, craftsmen became more ambitious. They achieved ornate effects with diagonal beams and cross-timbers and embellished gable-ends and lintels with carvings of animals, floral patterns, and sometimes mottoes or inscriptions.

Many of the timbered mansions of the Chester "Rows" are decorated in this way. In Watergate Street, where the leading merchants lived in the city's sea-trading days, stands Bishop Lloyd's Palace. The date of

ENGLAND'S OLD TIMBERED BUILDINGS

this house is 1615, the same as that of the death of the prelate whose name it bears. Carved panels above and below the windows depict such familiar scenes from Biblical stories as Adam and Eve in the Garden of Eden, Cain murdering Abel, and Abraham about to sacrifice his son. Close by is God's Providence House, another imposing mansion of the same period. Tradition has it that this was the only house in Watergate Street to escape the plague which ravaged Chester soon after it was built, and so the thankful owner inscribed the main beam of his residence with the proverb, "God's Providence is Mine Inheritance", which can be easily read to this day.

Shrewsbury, a hill-top town almost encircled by the River Severn, is even richer in genuine old Tudor and Elizabethan houses. In the narrower by-ways—of which there are plenty—the upper storeys overhang the pavements at such alarming angles that residents can

almost shake hands across the street from opposite attic windows. Projecting upper storeys are a feature of many old timbered buildings in the towns. The idea was a practical one: to economize space at ground level. Built on firm foundations and perfectly balanced, they have hung securely above the streets for three or four centuries.

The finest of Shrewsbury's timbered houses stand on Wyle Cop and High Street, a continuous thoroughfare that winds uphill from the river. Among them there is a distinguished example of the straight-timbered style, Ireland's Mansion, with four lofty gables, three storeys high, above a row of shops. It dates from about 1575 and was the town-house of the Irelands of Albrighton, one of the great land-owning families of Shropshire in the sixteenth century. Like other period mansions about the town, its rooms contain fine oak panelling, decorative ceilings and richly carved fire-places.

The Wool Hall at Thaxted, Essex, dates back to the early days of the English cloth trade.





Ireland's Mansion in Shrewsbury, Shropshire, a fine example of the straight-timbered style.

Not far away are the black-and-white gatehouse of Shrewsbury's historic Council House, dating from 1620, and the much earlier King's Head Inn, whose leaning front has excellent carved woodwork. Dickens probably had such buildings as the latter in mind when, during a visit to Shrewsbury, he wrote of its "crookedest black-and-white houses, all of many shapes except straight shapes".

Southwards from Shrewsbury stands Ludlow, whose grim old castle looks out across the Severn Valley to the distant Welsh hills, from where many a surprise attack came in ancient days. Ludlow, too, abounds in timbered houses. Of these the most striking is the Feathers Hotel, with its intricate "magpied" front, low-beamed ceilings and carved fire-places. In the same neighbourhood is Stokesay Castle, the oldest moated manor-house in England. An Elizabethan half-timbered gateway gives access to the stern walls and towers of this nobleman's home of the thirteenth century, a period when war was being waged between the English and Welsh over their

The Feathers Inn, one of the most striking timbered buildings in the market town of Ledbury, Herefordshire.



The old King's Head Inn at Shrewsbury. The town is rich in Tudor and Elizabethan buildings.

respective claims to border territory.

Black-and-white architecture was also used to good effect in the construction of market-houses and guild-halls. These are still to be seen in many a square or high street, reminders of the prosperity of English towns under the Tudor sovereigns, when the powerful trade and craft guilds played an important role in municipal affairs.

At Much Wenlock, in Shropshire, the Old Guild-hall is typical of many built three or four hundred years ago. It is supported on stout oaken posts above the open market-place. In the long panelled room, now enriched with historic treasures, council meetings have been conducted ever since the guild-hall was opened in the reign of Queen Elizabeth I. One of the supporting posts was formerly used as a whipping-post. The wrist-fetters which held the offender while punishment was being administered are still attached to it.

Ledbury, a market town of Herefordshire, possesses two very striking timbered buildings, the Feathers Inn and the Market House. The



Some of England's most charming black-and-white cottages are in Shottery, Warwickshire.





The Lord Leycester Hospital in Warwick, founded in 1571 by the Earl of Warwick.

latter was built about 1633 by John Abel, the son of a farm-hand who turned builder and was responsible for several other fine timbered halls in the county. Charles I gave him the title "King's Carpenter" in recognition of his services.

In East Anglia there are other timbered halls dating back to the early days of the English cloth trade. A very beautiful specimen at Thaxted, in Essex, is closely associated with a colony of Flemish weavers who set up their hand-looms in its upper rooms and brought a long period of prosperity to the town. The huge, twin-gabled storeys are still supported by the original pillars.

England's small timbered cottages are widely scattered, and lend charm to many landscapes, particularly in the Midlands and the South. Many have been just as well preserved as the larger and more important buildings. In most cases they have been continuously occupied since the sixteenth or seventeenth century.

The oldest cottages are recognized as those with the greatest number of upright and cross beams embedded in the wattle or plaster walls. Some have very steep-angled roofs of thatch and contain attic bedrooms which are entered by ladder. In the south-eastern counties fillings of red brick take the place of the plasterwork used elsewhere.

Some of the most charming black-and-white cottages belong to Warwickshire in the heart of England. The leafy banks of Shakespeare's Avon River provide the setting for whole villages of them. One of the best known is Shottery on the outskirts of Stratford-upon-Avon, where the delightful thatched and timbered home of Anne Hathaway stands.

In Warwick town there is an impressive half-timbered building of another kind, belonging to the same period. This is the Lord Leycester Hospital, founded in 1571 by Robert Dudley, Earl of Warwick, who converted the existing building into an alms-house for retired soldiers of the county regiment. Ever since that time the quaint dwellings, ranged round a galleried courtyard, have been inhabited by army pensioners who wear the badge of the founder on their old-style cloaks.

The famous timbered and thatched cottage of Anne Hathaway at Shottery, on the outskirts of Stratford-upon-Avon.



EDITOR'S NOTE-BOOK

Dr. G. G. Campbell (*Mining in Nova Scotia*) is a native of Nova Scotia and a graduate of Dalhousie University. He is Principal of Sydney Academy and Supervisor of High Schools in the City of Sydney.

* * *

Mabel E. Jordon (*The British on San Juan Island*) is a free-lance writer from Calgary, Alberta. Many of her articles dealing with historical landmarks in the Canadian West have appeared in the Journal.

* * *

John A. Paterson (*Industry Comes Back to New Brunswick*), a graduate of Mount Allison University in Sackville, is Deputy Minister of Industry and Development in the New Brunswick Government.

* * *

W. H. Owens (*England's Old Timbered Buildings*) is a contributor from England whose work has appeared previously in the Journal. He has specialized in writing of the British scene, industries, crafts and customs.

AMONGST THE NEW BOOKS

The Land and People of Pakistan

by Herbert Feldman

(The MacMillan Company of Canada,
Limited. \$1.50)

This small volume belongs to the series *Lands and Peoples*. It aims at introducing one of the important but little-known new countries of South Asia and is especially welcome in view of the relative neglect which Pakistan has suffered at the hands of outside writers since her creation in 1947. With the departure of the British from India, the partition of the sub-continent brought into being two new states, India and Pakistan. Of these India is so much the larger, her influence so much the greater, and her problems so much the more difficult of solution that she tends to rob attention from her smaller neighbour. Although Mr. Feldman's book is brief and introductory in character, it is a step toward redressing the balance.

One may find here in brief compass and popular style an account of the movements and events which led to the emergence of Pakistan as a separate state for the Muslims of India and of the men who were the prime movers in its realization. There are

descriptive chapters dealing with the physical and climatic characteristics of the two major divisions of the country and setting forth the conditions of life which these impose upon the inhabitants. The tale is not limited to a description of crops, rainfall and the like, however, but seeks also to reveal the life of the people both in work and at play. Language, food, dress, recreation, festivals, arts and crafts, religion, and life in village and town are all treated, though often more cursorily than we might desire. Few countries exhibit such diversity in so many fields as does Pakistan, and few face such involved and difficult problems as are posed for her by this diversity and economic under-development combined with her division geographically into two parts separated by 1,000 miles of foreign (and hostile) territory. Mr. Feldman's book serves well to make the reader aware of the enormous challenge facing Pakistanis.

On the whole this book admirably fulfils the purpose for which it was written. At times it suffers from jerkiness in style, and there are some factual errors as, for example, the attribution of the Taj Mahal to the Moghul Emperor, Jahangir, or the identification of the Abbasi Khalifs

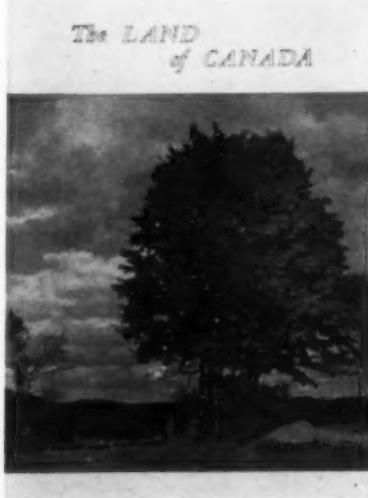
(Continued on page VI)

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(Continued from page V)

as Egyptian rulers. These defects are, however, outweighed by the book's virtues, and it may be recommended to all who desire a short but comprehensive introduction to Pakistan.

CHARLES J. ADAMS.

Dr. Charles J. Adams has been associated with the Institute of Islamic Studies at McGill University since its beginning in 1952. He has taught at Princeton University, and during the years 1955-57 he travelled and studied in Pakistan under a research grant from the Ford Foundation.

* * *

The Arctic Year

by Peter Freuchen and
Finn Salomonsen

(Longmans, Green and Company,
Toronto. \$6.95)

One of the important preparations for spending a year or so in the Canadian north is the selection of a small library. Some books select themselves — a Bible, an atlas, a complete Shakespeare, and *Arctic Canada from the Air* by Dunbar and Greenaway. To these should be added *The Arctic Year* by Freuchen and Salomonsen. It is not by any means a perfect book. In fact it is easy to find fault with it, but it contains an immense amount of information particularly about the birds and mammals of the north. The two authors, one well known as an explorer and the other as an ornithologist, have together produced a book that must appeal to everyone interested in the Arctic regions and particularly to those who live there.

After a short introduction, describing the north in very general terms, the book is divided into twelve chapters, one for each month. In this way the year is covered, month by month, and as the year passes the effect of the changing conditions on the flora and fauna is discussed. The Arctic is considered to be all the land north of the tree-line and all the seas north of the boundary between the warm salty southern waters and the cold, less saline polar waters.

In covering such a large and varied area the authors have faced a tremendous task, made more difficult by the fact that spring comes later and winter earlier with increasing latitude so that the Arctic year is in many ways more advanced in March in southern Greenland than it is in April in Ellesmere Island. No attempt has been made to discuss all areas in equal detail but Freuchen spent several years in the eastern Arctic as a member of the Fifth Thule Expedition and

northern Canada receives generous treatment.

There are a number of signs of hasty editing, for instance the captions for the maps on pages eight and sixteen have become interchanged. A more serious fault is the number of errors and over-simplifications. The Eskimo of the Chukchi Peninsula cannot easily understand the speech of the Greenlanders. The two dialects belong to two distinct and very different branches of the Eskimo language. It is incorrect to state that in north Canada the north wind never raises the temperature. Most Eskimos do not wait until all the meat in a camp has been eaten before they will go out hunting, nor do they find it very difficult to chip a hole through five or six feet of ice. Any Greenlander who went to Ellesmere Island to hunt musk-ox nowadays would find himself in trouble with the Royal Canadian Mounted Police. There is no evidence to indicate that the white whale arrives in Hudson Bay by hundreds of thousands, nor do the Eskimos net them wholesale up the Churchill River. Radio-carbon observations indicate the time when the ice of the ice islands was formed, but not the age of the ice islands themselves, which may have broken off from the Ellesmere ice shelf comparatively recently. Muskrat trapping in the Mackenzie Delta is no longer a highly profitable trade, nor is the blue fox now twice as valuable as the white. In Hudson Strait the fan hitch is normally used and the dogs do not run in single file or by pairs. General statements that there are no inviting small mountain brooks in the Canadian Arctic and that "the islands north of the (Canadian) mainland seem to be the repository of the driftwood, and you can find such great piles of wood on the coasts of small islands that they look like man-made fortifications" give a misleading impression. Perhaps the most surprising statement is that "When an Eskimo or an Indian in the northern part of Labrador finds a Grizzly Bear (*Ursus horribilis*) in his den, he walks around the hole and politely 'asks' the bear to come out". He might also ask the grizzly what he was doing in Labrador.

As these examples show, and many more could be quoted, it is easy to find mistakes and the book can be criticized for having too many, but in bringing together so much information and presenting it in such an interesting way the authors deserve far more praise than criticism. It is a fitting memorial to Peter Freuchen who died recently in the north he knew so well.

G. W. ROWLEY.

Dynamic Decade

by Eric J. Hanson

(McClelland and Stewart Limited,
Toronto. \$5.00)

Dynamic Decade is an analysis of what happens to an economy when a potential resource undergoes significant development. Prior to 1947, Alberta's economic structure was simple and essentially static. It was dependent largely on agricultural exports, and the population had remained stationary for many years. However in the decade 1947-56 the petroleum industry injected new vitality into the economy and provided a broad range of economic opportunities for a growing population.

The author introduces his book with a discussion of Alberta's resources and a fascinating recount of the history of oil discoveries from 1788. With the finding of a major oil field at Leduc in 1946 the decade of progress began.

Before 1946 Alberta's economy was in danger of going into a recession because of vagaries of climate and the annual market for wheat. With the discovery of such oil fields as Leduc, Redwater and Pembina and the growth of markets for oil and later natural gas and their products, a tre-

mendous inflow of capital took place, creating new income opportunities. This brought about an influx of population, improvements in transportation, hospital services and schools, the establishment of new industries and an overall higher standard of living throughout the province. Professor Hanson foresees a continuation of petroleum development and an increasingly stable agricultural industry in the next several decades. Moreover, with Alberta's economy now bolstered by a vigorous petroleum industry, the province is in a position to play a major role in the development of Canada's northland.

The author, an Associate Professor of Economics at the University of Alberta, has done much painstaking research into all phases of Alberta's economy, and especially into the history of oil exploration, the production and marketing of oil, natural gas and petrochemicals and the beneficial effects of the development of these natural resources and industries on the residents of Alberta. The statistics are interestingly presented with tables and charts. Chapters are amply broken down with subheadings and the book is well indexed to make it an excellent reference work for those interested in the oil industry, economics and sociological studies.

D. K. NORRIS

Dr. D. K. Norris is a geologist on the staff of the Geological Survey of Canada and has had much experience in geological mapping in the foothills of Alberta and in the Northwest Territories.

* * *

The Great Migrations

by Georges Blond, translated
by Frances Frenaye

(Brett-Macmillan Limited, Toronto,
\$4.00)

The Great Migrations is a journalist's story of half a dozen of the most spectacular, recurring, mass movements of animals. The animals which are dealt with at some length are greylag geese, salmon, eels, American bison, locusts and lemmings—a good selection for the author's purpose.

Blond has treated his subject "not as a scientist but as a writer", drawing his material from the writings of scientists and naturalists. His enthusiasm for his subject, which is apparent on every page, will no doubt arouse the interest of many of his readers, although those whose taste is for economy and restraint in expression may find his verbosity and dramatic flights of fancy somewhat tedious.

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To the scientist, migrations present two major groups of problems. One is concerned with causes—why have some species become migratory? What are the stimuli which periodically impel them to migrate? The other is concerned with orientation—how do migratory birds direct themselves from their summer home to their ancestral wintering grounds? How do salmon find their way from the ocean to their natal stream? It is to Blond's credit that his presentation of the many theories advanced to explain those questions, while incomplete, is justifiably inconclusive.

Many of the statements and implications about the life histories of the animals reported upon tax this reviewer's credulity, to say the least. It is difficult to accept, for example, that greylag geese should be so different from the various species of North American geese as one would gather from reading *The Great Migrations*. Do they use mud to hold together the reed stems and branches in their nests? This is not the habit of any other of the North American geese or ducks. Does the male greylag goose help to build the nest and sit on the eggs in the absence of the female? Such is not the case with any of the North American species. When

(Continued on page VIII)

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(Continued from page VII)

a greylag goose is bereft of its mate, does it live alone for the rest of its life? It was once generally believed that Canada geese would not re-mate, but that belief is now known to be erroneous.

Once one suspects inaccuracy in any part of a book, one becomes skeptical of the whole. Perhaps the book showed in a more favourable guise when it originally appeared in France as *La grande aventure des Migrateurs*.

DAVID A. MUNRO.

Mr. David A. Munro is chief ornithologist in the Canadian Wildlife Service, National Parks Branch, at Ottawa.

* * *

The Exploration of the Colorado River

by John Wesley Powell

(University of Toronto Press, Toronto, \$3.75)

In this day of satellites and talk of space travel it is refreshing to pick up an adventure story which deals with man against the forces of an earthly thing such as a river. Although it is eighty-nine years since John Wesley Powell and his men descended the Colorado River, their courage can still stir the imagination of the reader.

The publishers of this book are to be congratulated on placing it on the market once again. It is stated in the introduction to the volume that it has been forty-two years since the last edition of Powell's journey was published and that the previous editions have become collectors' items. I hope that this edition is a success and, as a result, will encourage the publishers to bring back other tales of the exploits of man in his quest for knowledge about the face of the earth.

This book will appeal to all who like adventure. In essence it is the diary of Powell's journey from Green River Crossing, Wyoming, down the Green and Colorado Rivers. The account covers the period from 24 May to 1st September 1869. The reader will find it difficult to lay the book down once he has started reading. The exploits of Powell and his party as they travel down dark canyons, shoot rapids, and work their way out of tight spots along the river is fascinating reading indeed.

The book is in no sense a scientific treatise, although Powell was at one time director of the United States Geological Survey and the first director of the Smithsonian Institution's Bureau of Ethnology.

Some of the illustrations appeared

in the original edition of the journey and others are taken from the Atlas to the United States Geological Survey No. 2 (1882). The only deficiency in the book is the lack of a map showing the area covered by the narrative.

GORDON D. TAYLOR.

Mr. Gordon Taylor is a geographer in the Provincial Branch of the British Columbia Department of Recreation and Conservation.

* * *

North American Head Hunting

by Grancel Fitz

(Oxford University Press, Toronto, \$5.50)

Mr. Fitz is one of the continent's leading authorities on big-game trophies. In numerous hunting trips spread over a period of more than twenty years, he has hunted all the legal big game species in North America. Record-class heads of thirteen species were secured on those hunts. From that wealth of experience, he has chosen ten hunts that vary in locale from the deserts of Mexico to the ice floes of Alaska. Some of the stories have appeared previously in popular sporting magazines in abridged form.

In the foreword the author has presented an effective apologia for sport hunting, and in particular trophy hunting. The individual hunts which deal with ten different species follow in ten chapters.

The style is factual and provides plenty of excitement without resorting to sensationalism. Passages dealing with knee-shaking traverses along mountain ledges and back-packing along seemingly unending Canadian portages are vividly described. Weekend hunters will gloat to learn that even the experts do not drop each quarry with a single well-placed shot. However, the expert's careful planning of each hunt is evident in each narrative. Even the experts will find little to quarrel with, although the gap in the ranges between the Rocky Mountain bighorn country and the Stone sheep country has a reasonable explanation, contrary to the opinion given by the author that "no one knows why".

The description of the aerial polar bear hunt presents some of the exasperations, difficulties and dangers associated with those hunts. It is doubtful if the present account will win more support of conservationists who are concerned about the effect of those hunts. The book is recommended for the sportsman's library and for the reader of adventure stories.

A. W. F. BANFIELD.

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